

CLAIMS

1. An active matrix display device comprising an array of display pixels, each pixel comprising:
 - 5 a current-driven light emitting display element (2) comprising an area of light emitting material (76) sandwiched between electrodes (74,80);
 - a light-dependent device (27,52,90) for detecting the brightness of the display element (2); and
 - a drive transistor circuit (16,22,24,29; 16,22,24,34,36,40) for driving a
- 10 current through the display element, wherein the drive transistor (22) is controlled in response to the light-dependent device output, wherein
- the light-dependent device (52,90) is located laterally of the area of light emitting material.
- 15 2. A device as claimed in claim 1, wherein the light-dependent device (27,52,90) comprises a photodiode.
3. A device as claimed in claim 2, wherein the photodiode comprises a PIN or NIP diode stack or a Schottky diode and top (93) and bottom (94) contact
- 20 terminals.
4. A device as claimed in claim 3, wherein the top (93) contact terminal extends over the top of the stack and down one side of the stack and acts as a light shield to pixels on the one side of the photodiode.
- 25 5. A device as claimed in any preceding claim, wherein the electrodes comprise a top substantially transparent electrode (80a) and a bottom substantially non-transparent, reflective electrode (74a).
- 30 6. A device as claimed claim 5, wherein the bottom electrode (74a) is for reflecting light from the display element to the light dependent device.

7. A device as claimed in claim 6, wherein the bottom electrode (74a) is for reflecting light emitted at an angle to the normal greater than a first angle to the light dependent device.

5 8. A device as claimed in claim 6 or 7, further comprising a reflecting layer (102) above the light dependent device and for reflecting light from the bottom electrode (74a) to the light dependent device.

9. A device as claimed in claim 8, wherein the device further comprises a
10 plurality of printing dams (78) and the light emitting material (76) comprises a printable material.

10. A device as claimed in claim 9, wherein the reflecting layer (102) is formed at the base of the printing dams (78).

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11. A device as claimed in claim 9, wherein the printing dams comprise an insulating body and a conducting metal layer (79) over the insulating body.

12. A device as claimed in claim 11, wherein the conducting metal layer (79)
20 provides a lower resistance shunt connecting the top substantially transparent electrodes.

13. A device as claimed in claim 11 or 12, wherein the conducting metal layer (79) defines the reflecting layer.

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14. A device as claimed in any one of claims claim 9 to 13, wherein the light sensitive devices (90) are formed beneath the printing dams.

15. A device as claimed in any one of claims 1 to 4, wherein the electrodes
30 comprise a top substantially transparent electrode and a bottom substantially transparent electrode (74).

16. A device as claimed in claim 15, wherein the device further comprises an additional reflective layer (70;62) beneath the bottom electrode (74).

17. A device as claimed in claim 16, further comprising a reflecting layer
5 (102;110) above the light dependent device (90) and for reflecting light from the reflecting layer (102;110) to the light dependent device.

18. A device as claimed in claim 17, wherein the reflecting layer (110) is formed at the level of the bottom electrode (74) of the light emitting display element.

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19. A device as claimed in claim 17, wherein the device further comprises a plurality of printing dams (78) and the light emitting material (76) comprises a printable material.

15 20. A device as claimed in claim 19, wherein the reflecting layer (102) is formed at the base of the printing dams (78).

21. A device as claimed in any preceding claim, wherein the light-dependent device extends alongside the area of light emitting material and extends along
20 substantially the full length of one side of the area of light emitting material.

22. A device as claimed in claim 21, wherein the light-dependent device extends around an upper and lower portion of the area of light emitting material.

25 23. A device as claimed in any preceding claim, wherein the light emitting display element comprises an electroluminescent display element.